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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
GRAHAM, ANDREW R	

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 12/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/648,012	WOOLFORK, C. EARL	
	Examiner	Art Unit	
	Andrew Graham	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6 and 7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6 and 7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Remarks/Amendment

1. Applicant's arguments with respect to claims 1,4,6, and 7 have been considered but are moot in view of the new ground(s) of rejection.

Specification

2. The specification, as filed 7/1/05, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. Recitations of new matter, are required to be cancelled from the amended version of the disclosure, as follows:

- page 6, line 11 "that may be as low as approximately 1.0 Mbps" conveys a throughput rate that is lower than supported by either the parent or the present application. This line incorporated new matter as of its introduction by way of the preliminary amendment of 10/25/05, even though the explicit objection thereto is newly raised herein. The applicant's remarks in regards to this aspect of the application, in pages 16 and 17 of the response, are acknowledged, but are not persuasive, at least because neither the parent case or the present application supports the 128 kHz sampling frequency of Equation 5. Further, the specification of the present

application does not mention a 4-bit ADC, as relied upon in the applicant's remarks.

Drawings

3. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 2 and 3 incorporate new matter, which is prohibited by 37 CFR 1.121(f). The drawings of the parent application disclose the nature of the low pass filtering being "after" the D/A converter in order to correct for out of band noise caused by the D/A converter (page 3, lines 17-20). Figure 2 of the parent case shows the filter 34 between the ADC 32 and the encoder 36, which differs from the order shown in Figure 2 of the present application. New matter is incorporated by this altered shown order, as well as the inference from the drawings that a signal containing error can be effectively low pass filtered after the erroneous part of the signal has been both encoded and channel encoded. A similar basis exists for the objection to Figure 3. The bandpass filter 54 is shown and described in the parent case as following the antenna 52 and the spread spectrum demodulator (62)(page 4, lines 6-25 of the parent application). New matter is incorporated by this drawing by virtue of its altered shown order, which suggests the bandpass filtering of a spread spectrum and digitally demodulated signals, which is not clearly supported by the present or parent application.

Claim Rejections - 35 USC § 112

4. Examiner's note is made of the terminology "in communication with" in the claim language of Claims 1, 4, 6, and 7. The rejections that follow have interpreted this phrase to mean "involved in an exchange of information", which serves as the broadest reasonable interpretation in light of the specification. Such a definition does not exclude the existence or presence of intervening components, as such intervening components would yet throughput information, permitting the exchange of information between other components at the input and output connections of such intervening components. To associate a more narrow interpretation, such as the "exchange of information through direct electrical interconnection" would necessitate a new matter rejection under 35 U.S.C. 112, 1st paragraph, on grounds similar to that applied above in regards to the drawings.

Claim Rejections - 35 USC § 112 - 1st paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 1 and 6** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The grounds upon which the following limitations are considered to involve new matter is discussed in further detail above, in regards to the corresponding matter found in the specification.

Claims 1 contains the following limitations which incorporate new matter:

"an ADC in communication with an encoder at a signal rate of less than approximately 1.0 Mbps"; neither the present application or the parent application support this rate of throughput between the ADC and the encoder. AS detailed above with regards to the specification, this concept is also considered new matter as it is presently written into the specification.

Claim 6 is rejected for reciting the same limitation in the seventh and eighth lines of the claim.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 1, 4, 6, and 7 is** rejected under U.S.C. 103(a) as being unpatentable over Altstatt (USPN 5771441) in view of Schotz et al (USPN 5946343) and Schotz (USPN 5491839).

Altstatt teaches an audio dongle for an portable audio device that utilizes a RF connection to interface a pair of wireless headphones.

Specifically regarding Claim 1, Altstatt teaches:

A wireless audio music system (Figure 1) for communication of an audio music signal (from 10) from the analog headphone jack (12) connected to a battery powered transmitter (14) and received by a battery powered headphone receiver (col. 4, lines 29-53; battery for transmitter 43, col. 6, line 54; battery for headphone receiver is implicit in the wireless nature of the headphones and context of Altstatt) comprising:

an analog headphone jack (12) from an audio music source (10) in communication with a battery powered digital transmitter (14)(col. 4, lines 29-39),

The headphone system of Altstatt includes an antenna 24, receiver 22, and earphones 26 and 28.

However, the system of Altstatt is an analog transmission system that, in operation, lacks the benefits of a digitally encoded and transmitted audio signal.

With regard to the limitations of Claim 1, Altstatt does not clearly teach or suggest:

- A wireless digital audio music system for spread spectrum communication

- said battery powered digital transmitter converts an analog audio music signal from said existing analog headphone jack to a

digital signal using an ADC in communication with an encoder at a signal rate of less than approximately 1.0 Mbps

- said encoder in communication with a channel encoder

- said digital modulator in communication with a spread spectrum communication modulator that utilizes a code generator to create user code;

- said spread spectrum communication modulator in communication with a transmit antenna that transmits at a radio frequency of approximately 2.4 GHz for receipt by a receiving antenna;

- said receiving antenna in communication with a spread spectrum communication demodulator

- said spread spectrum communication demodulator in communication with a receiver code generator and with a digital demodulator;

- said digital demodulator in communication with a wide bandpass filter;

- said wide bandpass filter in communication with a channel decoder;

- said channel decoder in communication with a receiver decoder;

- said receiver decoder in communication with a DAC;

- said DAC in communication with a filter to pass the analog music signal in the approximate frequency band of 20Hz to 20 kHz; and

- said filter passing analog music signal will be amplified for processing to a speaker headphone set to provide high quality music for listening by a single user wearing the headphones.

Schotz et al discloses a wireless digital audio transmission system.

Specifically regarding Claim 1, Schotz et al, when considered in view of the teachings of Altstatt applied above, teaches or at least suggests:

- A wireless digital audio music system for spread spectrum communication (Figure 1 of Schotz et al in view of Figure 1 of Altstatt, col. 6, lines 6-54; col. 14, lines 5-12)

- said digital transmitter (22 of Schotz et al in view of 14 of Altstatt) converts an analog audio music signal from said existing analog headphone jack (analog input 30A,30B of Schotz et al in view of analog connection 12,18 of Altstatt) to a digital signal using an ADC (52) in communication with an encoder (300) at a signal rate of less than approximately 1.0 Mbps (col. 7, lines 6-15; col. 14, lines 43-58, noting that the ADC described in Schotz et al may run at lower sampling frequencies, which at least suggests the 'less than approximately 1.0 MBps', see for example, note 3 on page 11 of the included Product Spec fot the Phillips SAA7360; again, as noted above 'in communication' has been interpreted herein to mean passing a signal between the two components, regardless of other components that may be disposed between two said components)

- said encoder (300) in communication with a channel encoder (98)(col. 9, lines 1-48; col. 14, lines 61-65)

- said digital modulator (102) in communication with a spread spectrum communication modulator (104) that utilizes a code generator

(106,308) to create user code (102 modulates input signal to produce I,Q signals, col. 10, lines 17-24; spread spectrum, col. 14, lines 5-12, col. 15, lines 40-52; code generator and user code corresponds to either house select code or PN code, col. 10, lines 43-47 or col. 15, lines 40-52; either can be considered to generate 'user codes' in context of Schotz et al and particularly Altstatt in that the use of a transmitter corresponds to a particular user operating said transmitter);

- said spread spectrum communication modulator (104) in communication (via 108) with a transmit antenna (38) that transmits at a radio frequency of approximately 2.4 GHz for receipt by a receiving antenna (40)(col. 6, lines 39-42; col. 10, lines 31-37)

- said receiving antenna (40) in communication with a spread spectrum communication demodulator (comprising 144,146,148; col. 11, line 13 - col. 12, line 24; col. 15, lines 45-52)

- said spread spectrum communication demodulator (144,146,148) in communication with a receiver code generator (408 or house code generator, col. 11, lines 13-56; col. 15, lines 45-52) and with a digital demodulator (202)(202 reverses phase shift modulation and combines signals, col. 12, lines 41-47);

- said digital demodulator (202) in communication with a wide bandpass filter (such as 138 or 142 or 178, via components of 140,146)(col. 11, lines 14-24, col. 12, lines 1-11, noting that audio signals require wideband transmission col. 2, lines 58-60, which infers such a wideband nature on these filters);

- said wide bandpass filter (such as 138 or 142 or 178) in communication (via components of 140,146) with a channel decoder (198)(col. 12, lines 1-28);

- said channel decoder (198) in communication with a receiver decoder (400)(col. 15, lines 10-18);

- said receiver decoder (400)in communication with a DAC (216)(col. 15, lines 10-26);

- said DAC (216) in communication with a filter (218A,218B) to pass the analog music signal in the approximate frequency band of 20Hz to 20 kHz (signal is music, col. 2, lines 55-58; filtering col. 13, lines 57-67)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to modify the wireless audio system of Altstatt to incorporate the digital transmission and reception scheme of Schotz et al for the wireless communication of full range audio data. The motivation behind such a modification would have been that such a digital transmission would have provided a number of benefits, including the reception of CD-quality sound and forwarding error correction, the latter of which would have enabled the system to account for errors in transmission. The digital-based system of Schotz et al would have also enabled the option of muting the output signal in the presence of sufficient levels of error. The spread spectrum technique of Schotz et al would have also limited interference from another signal to cause error in only one portion of the transmitted signal rather than the entire signal. Further, the

transmission components of Schotz et al would have also permitted transmission over unlicensed frequency bands.

While the system of Altstatt in view of Schotz et al discloses a variety of filtering and other signal modifications, Altstatt in view of Schotz et al is not considered to clearly teach or suggest:

- said channel encoder in communication with a digital low pass filter

- said digital low pass filter in communication with a digital modulator

- said DAC in communication with a filter that is a low pass filter

- said filter passing analog music signal will be amplified for processing to a speaker headphone set to provide high quality music for listening by a single user wearing the headphones.

However, Schotz et al incorporates another digital wireless system by reference, issued to Schotz.

Specifically regarding the limitations of Claim 1, Schotz, in view of the teachings of Altstatt and Schotz et al as applied above, teaches or at least suggests:

- said channel encoder (300 of Schotz et al) in communication with a digital low pass filter (60 of Schotz)(col. 6, lines 41-53 of Schotz for lowpass filtering buffer 60, in view of modification listed below)

- said digital low pass filter (60) in communication with a digital modulator (102 of Schotz et al)(col. 6, lines 41-53 of Schotz for lowpass filtering buffer 60, in view of modification listed below)

- said DAC (216 of Schotz et al, which provides output signal) in communication with a filter that is a low pass filter (152 of Schotz in view of 218A,B of Schotz et al)

- said filter (152) passing analog music signal will be amplified (by 156) for processing to a speaker headphone set (Figure 1 of Schotz, in view of headphones of Altstatt) to provide high quality music for listening by a single user wearing the headphones (col. 4, lines 2-5; col. 10, lines 19-22, noting that signal expansion is one form of amplitude control; it is further noted that otherwise output amplifying an audio signal for application to speakers is substantially well-known in the art).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the low-pass filtering buffer of Schotz as part of the circuitry processing the output signal of the ADC (that is, as part of the signal path following the ADC) in the transmitter of Altstatt in view of Schotz et al. The motivation behind such a modification would have been that such a filtering buffer would have removed high frequency harmonics resulting from the multiplexing of the signal in the ADC. To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate low pass filtering as taught by Schotz for the output filters of Altstatt in view of Schotz et al. The motivation behind

such a modification would have been that such low pass filtering would have enabled the removal of any pilot or multiplexing byproducts yet present in the output signal. To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the compression and expansion circuitry of Schotz as part of the input and output handling circuitry of the system of Altstatt in view of Schotz et al. The motivation behind such a modification would have been that such a form of signal amplitude control would have placed the throughput audio signals within the linear operating ranges of the audio channels in the transmitter and receiver.

Regarding Claim 4, please refer above to the functions corresponding to the components cited above in the rejection of the similar limitations of Claim 1. The citations provided therein form the basis for the rejection of the similar limitations of the method steps of Claim 4. In addition, the claimed power level and distance of approximately 10 ft is at least considered suggested by Schotz et al's reference to a range within 10 ft (col. 5, lines 26-36).

Regarding Claim 6, please refer above to the components cited above in the rejection of the similar limitations of Claim 1, particularly the first portion of Claim 1. The citations provided therein form the basis for the rejection of the similar limitations of the apparatus of Claim 6.

Regarding Claim 7, please refer above to the components cited above in the rejection of the similar limitations of Claim 1, particularly the first portion of Claim 1. The citations provided

therein form the basis for the rejection of the similar limitations of the apparatus of Claim 7.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 571-272-7517. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ag

HUYEN LE
PRIMARY EXAMINER